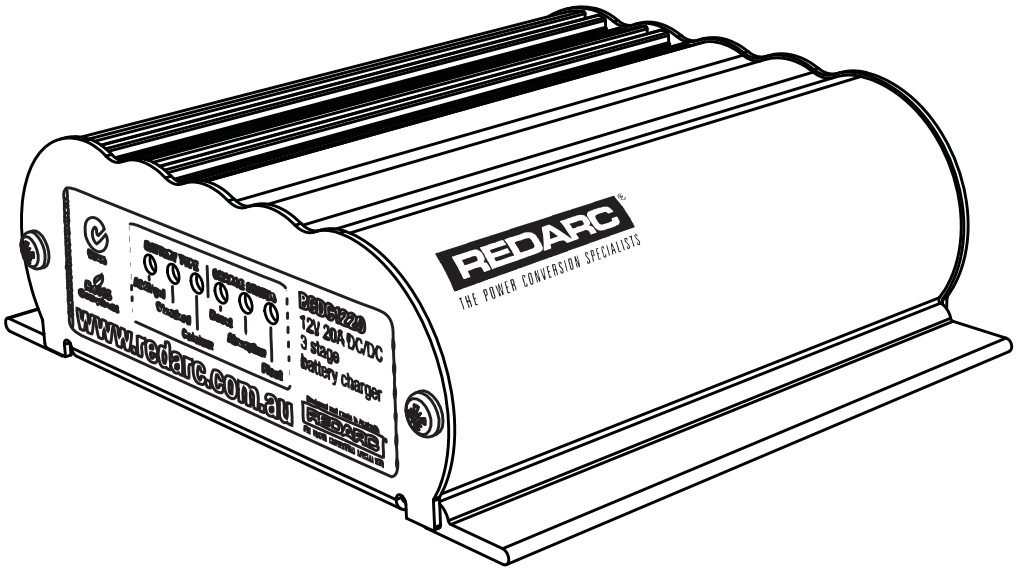
THE POWER OF

REDARC®

20A In-vehicle 3-Stage 12V Battery Charger

BCDC1220



AUSTRALIAN DESIGNED

AUSTRALIAN BUILT

TWO YEAR WARRANTY

THE BCDC1220

The BCDC1220 In-vehicle Battery Charger features technology designed to charge your batteries to 100%, regardless of their type or size. By providing a unique charging profile to each specific battery type, the BCDC1220 In-Vehicle Battery Charger is able to achieve and maintain an optimal charge in your auxiliary battery, at all times.

WARNING & SAFETY INSTRUCTIONS

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they are supervised or have been instructed on how to use the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

Do NOT disassemble the BCDC1220 - the internal circuitry contains hazardous voltages. Attempting to service the unit yourself may result in electric shock or fire and will void the unit warranty.

Do NOT use the BCDC1220 to charge non-rechargeable batteries. Doing so may result in harm to the user and/or damage to the BCDC1220. Only use the BCDC1220 for charging Standard Lead Acid, Calcium content, Gel & AGM type 12V batteries.

All lead acid batteries produce harmful, explosive gases. The Battery should be mounted in a well ventilated area, as far as possible from any ignition sources. Do NOT smoke when in the vicinity of the battery under charge.

Battery acid is a harmful substance. Care should be taken when working with lead acid batteries, if the acid comes into contact with your eyes or skin, immediately wash the affected area with cold running water and seek medical assistance. Eye protection and gloves should be worn when handling lead acid batteries.

The BCDC1220 will achieve best results when proper battery maintenance is regularly performed. This includes but is not limited to checking water and specific gravity levels of the battery.

Warning! Check the manufacturers data for your battery and ensure that the ‘Absorption’ voltage of the profile you select does not exceed the manufacturers recommended maximum charging voltage. If the ‘Absorption’ voltage for your battery type is too high, please select another charging profile.

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Specifications

	BCDC1220		
DC Input Voltage Range	9V-32V		
	Gel/AGM	Std Lead Acid	Calcium Content
Absorption Voltage	14.5V	14.9V	15.3V
Float Voltage	13.3V	13.3V	13.3V
No Load Current	<100mA		
Standby Current	<5mA		
Input Fuse Rating 12V/24V	30A/20A (Not supplied)		
Output Fuse Rating	30A (Not supplied)		
Output Power	300W		
Ambient Temperature	-20°C to +80°C		
Minimum O/P Battery Volts	3V		
Weight	450g		
Dimensions	100x120x37mm		
Warranty	2 years		
Standards	CE, C-Tick, AS/NZS CISPR11:2004		

1 PRODUCT FUNCTION

The BCDC1220 is a multi stage, 12V, 20A, DC-DC battery charger that operates from an input of either 12V or 24V nominal. The input voltage of the BCDC1220 can be above, below or equal to the output voltage making it ideal for charging from a 24V vehicle or charging an auxiliary 12V battery where the distance from the main battery may cause a significant voltage drop.

1.1 Operation

When the BCDC1220 is turned on, it will move into the bulk charging stage called Boost stage. Boost stage maintains a constant current until the battery voltage reaches its set point. The current in Boost stage may vary during operation in order to maintain safe operating temperature.

The charger will then move to Absorption stage. This stage maintains a constant voltage level for a predetermined period of time or until the current being drawn by the output drops to less than 4A for 30 seconds; after which the charger will enter Float stage.

Float stage maintains 13.3V on the output battery, keeping the battery topped up. This counteracts the battery's self discharging. When a load applied to the battery causes it to lose charge, the charger will move back into Boost.

1.2 Turn On/Off Thresholds

	12V	24V
Low voltage conditions (open circuit, tested every 100s)	Turn ON above 13.2V	Turn ON with Ignition
	Turn OFF below 12.7V	Turn OFF with Ignition
Low voltage conditions (loaded, constantly tested)	Turn OFF instantly below 8V	Turn OFF instantly below 8V
	Turn OFF after 20 secs below 9V	Turn OFF after 20 secs below 9V
Over voltage shutdown	Turn ON below 32V	Turn ON below 32V
	Turn OFF instantly above 32.5V	Turn OFF instantly above 32.5V
	Turn OFF after 20 secs above 32.1V	Turn OFF after 20 secs above 32.1V
Under voltage shutdown	Shutdown if Output Battery < 4V	

1 PRODUCT FUNCTION

1.3 Display Panel

The BCDC1220 has three Battery Type Settings available. These settings enable optimal charging profiles for the auxiliary battery. The battery type selected is displayed via the LEDs on the front panel in the section 'Battery Type'. In addition to the battery type, the status of the charger is indicated via three LEDs. The 'Charging Status' shows when the unit is in BOOST, ABSORPTION or FLOAT. In order to give more information, the applicable LED will flash to indicate the output by the unit. The longer the flash, the more current the charger is putting out. If the LED is ON solid, then the unit is supplying a full 20A to the auxiliary battery.

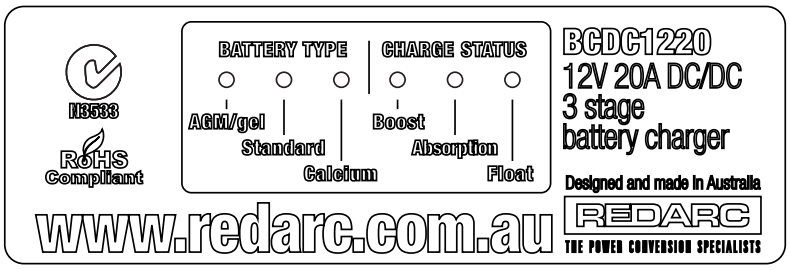


Figure 1.3.1 - BCDC1220 Front Panel

Standby mode is entered when the unit is not charging. In this mode, the Battery Type LED will blink approx once per second; the charging status LEDs will be off. In this mode, if the battery type wire is moved then the selected battery type will update.

2 INSTALLATION

1 Mount the unit to a flat surface close to the auxiliary battery and away from any heat sources. The unit will operate optimally below 55°C with good airflow. At higher temperatures the unit will de-rate output current.

2 Wire into vehicle as per the applicable diagram on the next pages, and following the steps below.
The BCDC1220 is connected using 5 wires, listed below:

• Source Select	Blue	
• Battery Type	Orange	
• Input Battery Positive	Red	30A Fuse (not supplied)
• Common Ground	Black	
• Output Battery Positive	Brown	30A Fuse (not supplied)

1. Wire the 'Common Ground' wire to a ground point that is common to both the Start battery and the Auxiliary battery to be charged. This point may be on the chassis of the vehicle, on the chassis of the trailer/camper/caravan or directly wired to both batteries, depending on your installation requirements.
2. Wire the 'Output Battery Positive' to the Auxiliary battery positive terminal. Ideally the BCDC unit should be a maximum of 1 metre in cable length from the battery positive terminal, and should be wired with a minimum of 3mm² or 5mm auto cable.
3. Wire the 'Input Battery Positive' wire to the Start battery positive terminal. Below is a table outlining the required cable size for a given cable install length. Always choose a wire diameter equal to or greater than what is specified below.
   NOTE: Appropriate sized fuses MUST be used to protect system wiring, values noted above are a guide only and fuses should be determined according to specific installation requirements.

Cable Install Length (m)	Minimum Wire Size (mm²)	Recommended Wire Size (mm²)	Closest (BAE, B&S, AWG or auto)
1 - 3	3	3.5	6mm auto
3 - 5	3	5.7	8 B&S
5 - 9	3	10.2	8 B&S

5. Wire the 'Battery Type' wire according to the type of Auxiliary battery you have installed. This wire is monitored when the charger is not charging.
4. Wire the 'Source Select' wire according to your installation requirements. For a setup charging from a 12V alternator, connect this wire to the 'Battery Input Positive' wire. For a setup charging from a 24V alternator, connect this wire to 'Ignition Input'.

Connection	Battery type (Orange)	Source select (Blue)
Positive supply	Calcium	12V Alternator charge
Ground (Chassis earth)	Standard Lead Acid	N/A
Not connected	AGM or Gel	N/A
Ignition Input	N/A	24V Alternator charge

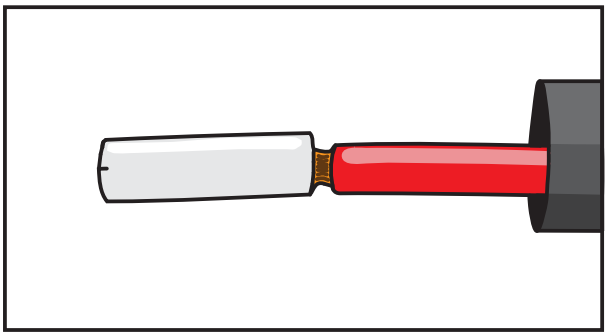
2 INSTALLATION

IMPORTANT NOTE: Battery type selection refers to a typical installation where the battery and unit are mounted in a low to mid temperature situation. For situations of higher temperature such as under the bonnet or in a caravan battery box, a softer profile (eg Std Lead Acid instead of Calcium) may need to be selected to avoid damage to the battery.

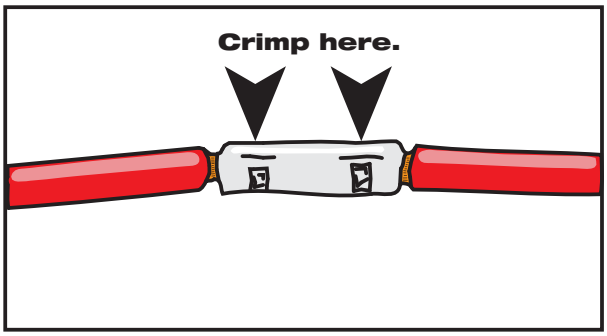
2.1 Wiring

The wires on the BCDC1220 unit carry higher than 20 Amp, and it is important to make a good, low resistance, electrical connection that will not degrade over time. Failure to make a good, reliable contact may result in breakdown of the wire insulation and cause a short circuit, or worst case a fire. We recommend that this activity be undertaken by an appropriately trained person.
Redarc recommends using a soldered butt splice crimp connection that is covered with heatshrink. The process should be to feed the heatshrink over the wires, crimp the wires into the butt splice, then solder the wires on the butt splice, and finally heat the heatshrink. Do not solder the wire before crimping.
The appropriate sized butt splice should be selected: for example if 8AWG wires are used to connect the unit then an 8AWG butt splice should be used. If the wire gauge brought up to the unit is larger than the 8AWG, then it is recommended to use a butt splice that has two different size entrys, each matching the respective wire size. Various butt splices are available from auto electrical suppliers.
Crimping provides good mechanical connection, soldering provides a long lasting electrical connection and forming of the heatshrink will prevent any shorting/ contact with your vehicle chassis.

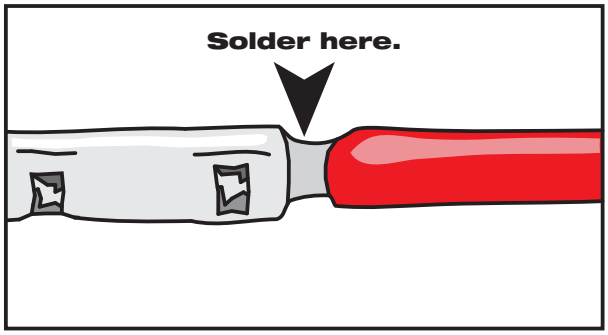
The term ‘crimping’ refers to a method of firmly attaching a terminal or contact to the end of an electrical conductor by pressure forming or reshaping a metal barrel onto the connector. The forming of a satisfactory crimp is dependent upon the correct combination of conductor, crimp barrel and crimping tool. When the correct combination of equipment is employed, a crimp that has both good electrical and mechanical characteristics will be formed.
Butt splices are used to dress and terminate multiple conductors of the same or different gauges in an end-to-end or series configuration.



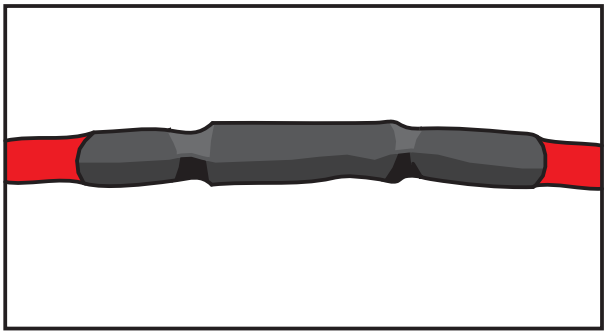
Slip heatshrink over wire and insert wires into butt splice. Keep heatshrink away from joint until after soldering is complete and has cooled.



Crimp both wires to the butt splice using indent type crimpers.



Solder the wires to the butt splice. Ensure that a good connection is made.



Wait for the butt splice to cool, slip heatshrink over the joint and heat.

Figure 2.1 - Ensuring a good wiring connection

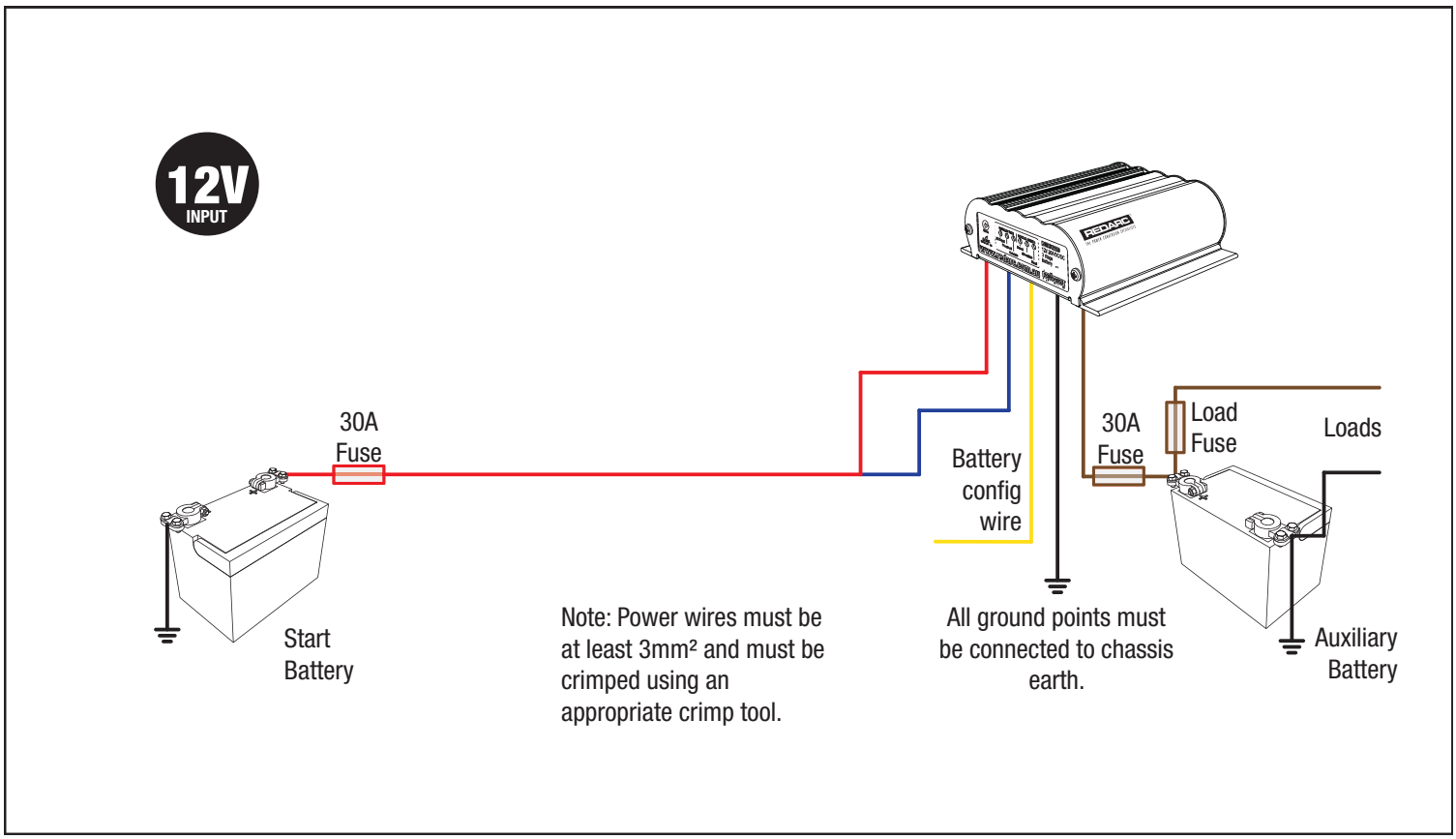


Figure 2.2 - Standard setup for a 12V Start Battery

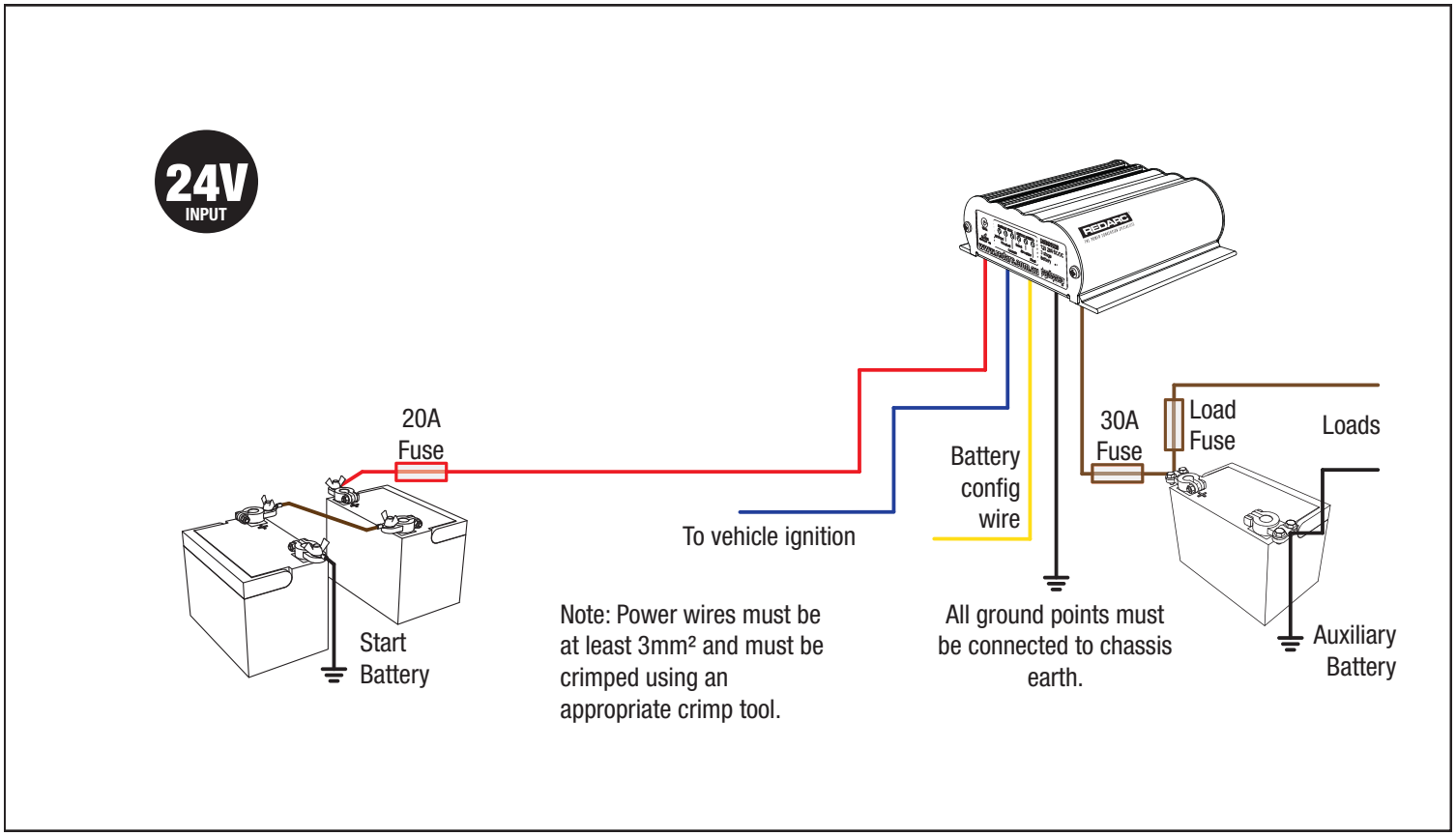


Figure 2.3 - Standard setup for a 24V Start Battery

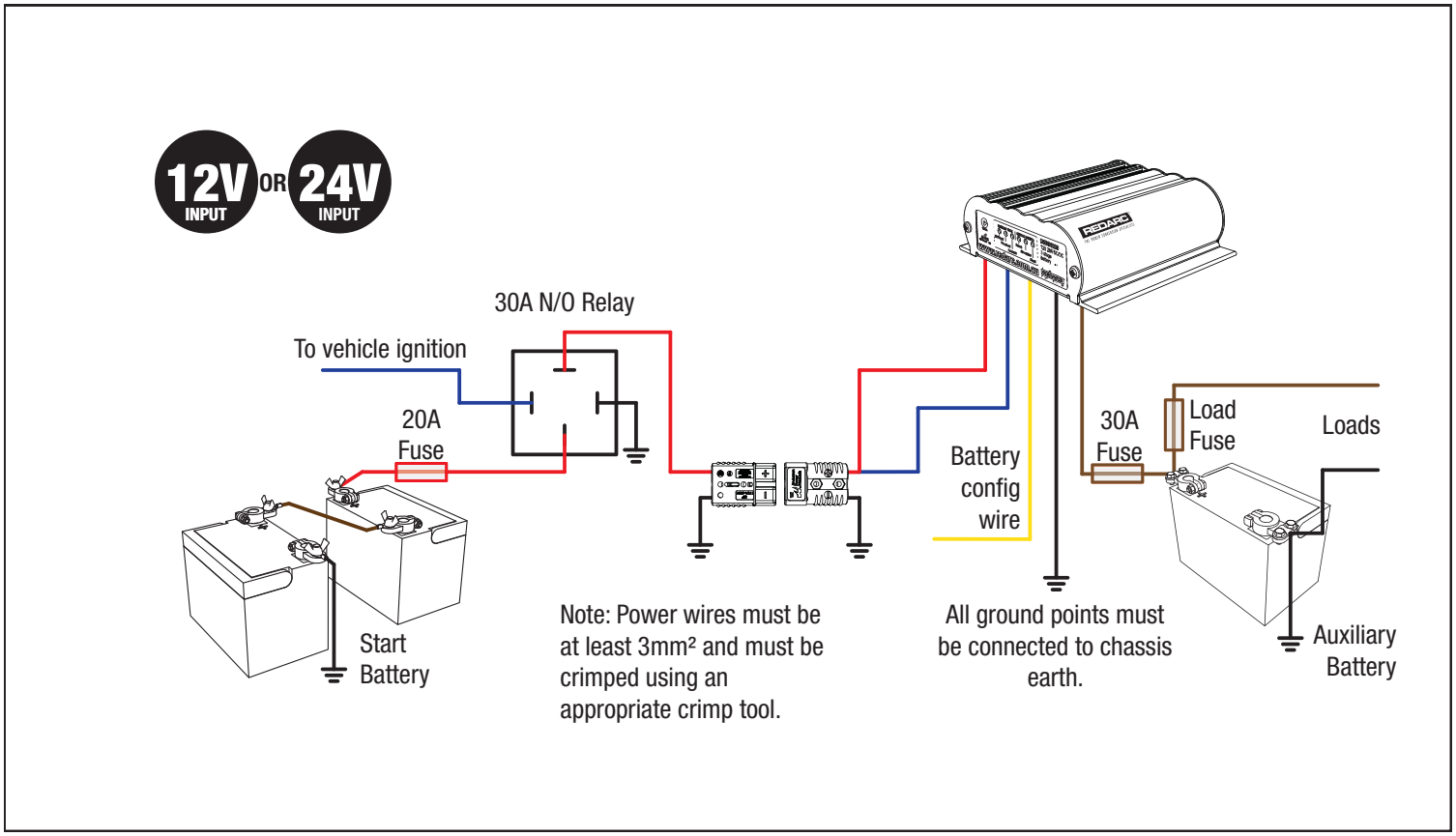


Figure 2.4 - Standard setup for a 24V Start Battery using relay for ignition switch

3 TWO YEAR PRODUCT WARRANTY

Over the last three decades our company has established a reputation as the power conversion specialist.
A 100% Australian-owned company, we have met the needs of customers in transport and other industries through exciting, innovative thinking.
We believe in total customer satisfaction and practice this by offering our customers:

- **Technical advice free of jargon and free of charge**
- **Prompt turnaround of orders throughout Australia and globally**
- **Friendly, personalised, professional service and product support**

In the unlikely event that a technical issue arises with a Redarc product, customers are encouraged to initially contact the Redarc Technical Support Team on (08) 8322 4848 or power@redarc.com.au for prompt and efficient diagnosis and product support.

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

The benefits of this Warranty are in addition to other rights and remedies available at law in respect of the Products and shall not derogate from any applicable mandatory statutory provisions or rights under the Australian Consumer Law.

Redarc Electronics Pty Ltd atf the Redarc Trust trading as Redarc Electronics (**"Redarc"**) offers a warranty in respect of its Products where the Products are purchased from an authorised distributor or reseller of Redarc by a person (**"Purchaser"**), on the terms and conditions, and for the duration, outlined below in this document (**"Warranty"**).

1. In this Warranty, the term **Products** means:
   1.1 all products manufactured or supplied by Redarc (excluding its solar products which are covered by Redarc's Solar Product Warranty); and
   1.2 any component of or accessory for any product in clause 1.1 manufactured or supplied by Redarc.

Offer and duration of product warranties

2. Redarc warrants that its Products will be free, under normal application, installation, use and service conditions, from defects in materials and workmanship affecting normal use, for **2 years** from the date of purchase (**Warranty Period**).
3. Where a Product malfunctions or becomes inoperative during the Warranty Period, due to a defect in materials or workmanship, as determined by Redarc, then subject to further rights conferred by the Australian Consumer Law on the Purchaser, Redarc will, in exercise of its sole discretion, either:
   3.1 repair the defective Product;
   3.2 replace the defective Product; or
   3.3 provide a refund to the Purchaser for the purchase price paid for the defective Product,

   without charge to the Purchaser.
4. The warranty given by Redarc in clause 3 covers the reasonable costs of delivery and installation of any repaired or replaced Products or components of Products to the Purchaser's usual residential address notified to Redarc, together with the reasonable costs of removal and return of any Products determined by Redarc to be defective.
5. If the Purchaser incurs expenses of the nature referred to in clause 4 in the context of making a claim pursuant to this Warranty that is accepted by Redarc, the Purchaser will be entitled to claim for reimbursement of those expenses which Redarc determines, in exercise of its sole discretion, to be reasonably incurred, provided that the claim is notified to Redarc in writing at the postal address or email address specified in clause 21 and includes:
   5.1 details of the relevant expenses incurred by the Purchaser; and
   5.2 proof of the relevant expenses having been incurred by the Purchaser.

Exclusions and limitations

6. This Warranty will not apply to, or include any defect, damage, fault, failure or malfunction of a Product, which Redarc determines, in exercise of its sole discretion, to be due to:
   6.1 normal wear and tear or exposure to weather conditions over time;
   6.2 accident, misuse, abuse, negligence, vandalism, alteration or modification;
   6.3 non-observance of any of the instructions supplied by Redarc, including instructions concerning installation, configuring, connecting, commissioning, use or application of the Product, including without limitation choice of location;
   6.4 failure to ensure proper maintenance of the Product strictly in accordance with Redarc's instructions or failure to ensure proper maintenance of any associated equipment or machinery;
   6.5 repairs to the Product that are not strictly in accordance with Redarc's instructions;
   6.6 installation, repairs or maintenance of the Product by, or under the supervision of, a person who is not a qualified auto electrician or technician, or if non-genuine or non-approved parts have been fitted;
   6.7 faulty power supply, power failure, electrical spikes or surges, lightning, flood, storm, hail, extreme heat, fire or other occurrence outside the control of Redarc;
   6.8 use other than for any reasonable purpose for which the Product was manufactured;
   6.9 any indirect or incidental damage of whatever nature outside the control of Redarc.
7. Warranty claims in respect of a Product must be made in writing to Redarc at the postal address or email address specified in clause 21 within the Warranty Period. Such claims must include the following:
   7.1 details of the alleged defect or fault and the circumstances surrounding the defect or fault;
   7.2 evidence of the claim, including photographs of the Product (where the subject of the claim is capable of being photographed);
   7.3 the serial number of the Product, specified on the label affixed to the Product; and
   7.4 proof of purchase documentation for the Product from an authorised distributor or reseller of Redarc, which clearly shows the date and place of purchase.

   The return of any Products without the prior written instructions of Redarc will not be accepted by Redarc.
8. Without limiting any other clause in this Warranty, Redarc has the right to reject any Warranty claim made by a Purchaser pursuant to this Warranty where:
   8.1 the Purchaser does not notify Redarc in writing of a Warranty claim within the Warranty Period;
   8.2 the Purchaser does not notify Redarc in writing of a Warranty claim within 1 month of becoming aware of the relevant circumstances giving rise to the claim, so that any further problems with the Product are minimised;
   8.3 the serial number of the Product has been altered, removed or made illegible without the written authority of Redarc;
   8.4 the Purchaser is unable to provide proof of purchase documentation in accordance with clause 7.4 or evidence that the Product was properly installed and removed (if relevant), and that proper maintenance has been performed on the Product, by, or under the supervision of, a qualified auto electrician or technician, in accordance with the instructions of Redarc.
9. If the Product is found to be working satisfactorily on return to Redarc or upon investigation by Redarc, the Purchaser must pay Redarc's reasonable costs of testing and investigating the Product in addition to shipping and transportation charges. Where Redarc is in possession of the Product, the Product will be returned to the Purchaser on receipt of the amount charged.
10. Any replaced Products or components of Products shall become the property of Redarc.
11. Redarc may, in exercise of its sole discretion, deliver another type of Product or component of a Product (different in size, colour, shape, weight, brand and/or other specifications) in fulfilling its obligations under this Warranty, in the event that Redarc has discontinued manufacturing or supplying the relevant Product or component at the time of the Warranty claim, or where such Product or component is superior to that originally purchased by the Purchaser.

Other conditions of Warranty

12. If the Purchaser acquired a Product for the purpose of resupply, then this Warranty shall not apply to that Product.
13. In particular, the sale of a Product via an online auction, online store or other internet website by a party that is not an authorised distributor or reseller of the Product will be deemed to be a resupply within the meaning of the Australian Consumer Law and will render this Warranty void, as Redarc has no control over the storage, handling, quality or safety of Products sold by such persons.
14. A Purchaser shall only be entitled to the benefit of this Warranty after all amounts owing in respect of the Product have been paid.
15. While Redarc warrants that the Products will be free from defects in materials and workmanship in the circumstances set out in this Warranty, to the maximum extent permitted by law Redarc does not warrant that the operation of the Products will be uninterrupted or error-free.
16. To the maximum extent permitted by law, Redarc's determination of the existence of any defect and the cause of any defect will be conclusive.
17. Spare parts or materials for the Products are guaranteed to be available for a period of at least 2 years after purchase of the Products.
18. The agents, officers and employees of any distributor or reseller of the Products and of Redarc are not authorised to vary or extend the terms of this Warranty.
19. Redarc shall not be responsible or liable to the Customer or any third party in connection with any non-performance or delay in performance of any terms and conditions of this Warranty, due to acts of God, war, riots, strikes, warlike conditions, plague or other epidemic, fire, flood, blizzard, hurricane, changes of public policies, terrorism and other events which are beyond the control of Redarc. In such circumstances, Redarc may suspend performance of this Warranty without liability for the period of the delay reasonably attributable to such causes.
20. If a clause or part of a clause in this Warranty can be read in a way that makes it illegal, unenforceable or invalid, but can also be read in a way that makes it legal, enforceable and valid, it must be read in the latter way. If any clause or part of a clause in this Warranty is illegal, unenforceable or invalid, that clause or part is to be treated as removed from this Warranty, but the rest of this Warranty is not affected.

Redarc's contact details

21. Redarc's contact details for the sending of Warranty claims under this Warranty are:

Redarc Electronics Pty Ltd
23 Brodie Road (North), Lonsdale SA 5160
Email: power@redarc.com.au
Telephone: +61 8 8322 4848

THE POWER OF

REDARC®

Free technical assistance!

please contact

Redarc Electronics

23 Brodie Road North, Lonsdale SA

(08) 8322 4848

power@redarc.com.au

www.redarc.com.au

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